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8 November 1983

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# REPORT ON EUROPEAN CONGRESS ON MOLECULAR SPECTROSCOPY

## Scientists From 33 Countries Confer

Sofia SOFIA NEWS in English 5 Oct 83 p 8

[Text]

The 16th European Congress of Molecular Spectroscopy EUCMOS 16 was held in Sofia from September 12 to 16. During five days scientists from 33 countries in Europe, North and Latin America, Asia and Africa read some 400 reports, discussing 16 basic trends in the different spheres of this modern science.

'Excellent organisation, well done work, serious scientific level' I said Dr. Djurdjic from the USA. Prof. Van der Veken from Belgium added: 'A scien-

tific meeting is successful to me when I leave enriched with new knowledge and new ideas. At this congress I acquainted myself with some very important problems of present-day molecular spectroscopy which will be of exceptional significance for my further scientific studies. I am extremely pleased with the splendid conditions offered by our hosts.'

After the end of the congress, organisers and participants alike unanimously agreed that

this, the so far largest scientific forum in this field, will make a serious contribution both to its fundamental development and its practical application in physics, chemistry, biology and industry. All the reports and scientific papers read at the congress will be published in the English language journal *Problems of Molecular Spectroscopy*. In two years time the scientists will meet again in Madrid for their next congress.

Delegates to the Congress talk to SN:

## Bulgarian Research Workers' Successes

Sofia SOFIA NEWS in English 5 Oct 83 p 8

[Comment to SOFIA NEWS by Prof Orvill Thomas, University of Salford, England, president of the International Committee]

[Text]

The idea for this congress came to being soon after the last World War when scientists principally in England, France and the F.R. of Germany decided that it was time for peace to start. Since then this congress has met every two years with one exception. The reason that Bulgaria was chosen for this meeting is that in the last 20 years molecular spectroscopy has advanced in a very strong fashion in Bulgaria. The impetus for the excellent work done in the Academy of Sciences has come from prof.

Assen Trifonov, the head of the Department of Physical Methods in organic chemistry of the Academy. He has always supported the younger members of his section and to a very high degree he is principally responsible for obtaining some of the excellent instrumentation of their laboratory. In the last 20 years many Bulgarian spectroscopists worked in the most important laboratories in Western Europe and also in the USA. Their work which has been excellent and first class has produced a feeling among

the international board of EUCMOS that Bulgaria should be chosen for the 1983 meeting.

Now I am for the seventh time in Bulgaria. I first came here as a tourist in 1970; scientists however are never to relax completely. Then I found out that in Bulgaria there are very eminent spectroscopists and I arranged to meet them. The people concerned were Dr. Bozhidar Yordanov from the Academy of Sciences and Boris Gulubov from Sofia University. Subsequently both of them worked in my laboratory and

they came back on several occasions. Other Bulgarian scientists also came to work on the laboratories at the University of Salford. In particular Valentin Dimitrov did excellent work. The collaboration with Bulgarian scientists still carries on and joint publications have been issued regularly. Subsequently my visits have been arranged by Prof.

B. Kutev, Director of the Centre of Chemistry who has had such a great influence for progress in the international reputation of Bulgarian science.

The aim of our congresses has always been to obtain spectroscopists from the entire

world. The Bulgarian National Committee under the able leadership of prof. Simova were very fortunate and have been able to invite prof. Gerhard Herzberg (of Canada) - a 1971 Nobel Laureate, who opened the congress and also prof. Nicolaas Bloembergen of the USA, a 1981 Nobel Laureate. The plenary lectures were all of the top international spectroscopic family and their contributions were very valuable.

The Bulgarian National Committee was able to provide for our congress the Palace of Culture 'Lyudmila Zhivkova' in Sofia which in my

estimation is the best centre that has ever been placed on the disposal of EUCMOS. The proximity of the hotels in which the delegations were placed has meant that the very high degree of international collaboration via scientific discussions was possible.

I have attended 15 of all our 16 meetings and I can say with great sincerity that the hospitality afforded by our Bulgarian hosts has been magnificent. The meeting in Sofia has been a great success as any other meeting and in respect of the facilities at the Palace of Culture, it has been the best.

### 'What We Expect From Science'

Sofia SOFIA NEWS in English 5 Oct 83 p 8

[Comment to SOFIA NEWS by Prof Gerhard Herzberg, 1971 Nobel Prize laureate, National Research Council, Canada]

[Text]

I think this congress compares very well other meetings we have attended and I would say it is a credit to the Bulgarian spectroscopists who were able to arrange such a nice conference, which is being attended by people from many countries including South America, North America, Soviet Union, Japan and many others. I think it is a very fine conference and a very nice accomplishment. I know there are a number of very competent and distinguished spectroscopists in Bulgaria. Bulgarian scientists have had interchange and exchange with people in other countries. They have visited them and have made important contributions on the basis of their contacts with other scientists as we all do.

The results of molecular spectroscopy are applied in industry a great deal and the dissociation energies of molecules are quantities that the industrial chemist needs for all his computation of industrial yields and they can be determined from spectroscopy but there are many other quantities. I mean

the whole calculation of thermal equilibria in gases; it is based on molecular spectroscopy and it is very important in industrial application. So there is no question that molecular spectroscopy has a very strong impact in the industrial processes.

Obviously a scientist needs imagination if he wants to make any progress. I think there is sometimes a misunderstanding in the way science works. People seem to think that science goes logically from one step to the next step and everything is completely logical. But really imagination plays a great role. If for a scientist there is a hunch and if the hunch was good, then he eventually has to prove his hunch and once he has proved that, he can start in a logical way to build one thing on to another. In fact I remember a quotation from a colleague, another Nobel laureate. The really good scientist will guess the answer of a certain problem when only half of evidence is in.

Some people, particularly politicians consider the sole purpose of science as the improvement of the condition of

man in the world. There are scientists, and I feel like one amongst them, who would agree with the famous mathematician Jacoby who said that the sole purpose of science is the glory of the human spirit. Why are we living, are we just living to live longer and to live better. Is that all that we want out of life or is there something higher in life.

Who are we in this cosmos, in the universe? What is the meaning of human existence and so on? These basic and philosophical questions to my mind are really at the top of the aims of science. Of course, science also helps humanity in living better and making it easier for man to overcome the necessities of life. And in medicine the application of science is very striking. I mean the average lifetime of people increased fantastically in the last 100 years because of the application of scientific methods to medicine. The practical uses of science are very great but I cannot forget that the basic aim of science is the understanding of nature.

## International Teamwork Broadens

Sofia SOFIA NEWS in English 5 Oct 83 p 8

[Comment to SOFIA NEWS by Bozhidar Yordanov, senior research associate, master of sciences, deputy chairman of the Organizing Committee for the Congress]

[Text] Molecular spectroscopy in Bulgaria started to develop some 20-25 years ago. The laboratories of the Institute of Organic Chemistry at the Bulgarian Academy of Sciences now work with infrared, Raman, ultraviolet and nuclear-magnetic spectroscopy. Nearly all Bulgarian specialists at industrial and scientific research laboratories in this sphere have been trained in these laboratories which are equipped with the latest apparatuses. Spectral apparatuses - expensive laboratory instruments - have been used for a huge number of studies and have yielded most significant contributions to molecular spectroscopy in Bulgaria. One of the most tangible results of EUCMOS 16 will be the renewal of our material base on infrared spectroscopy with the

introduction of Fourier spectrometry.

Cooperation in the sphere of molecular spectroscopy is maintained with the Institute of Physico-Chemistry of the Czechoslovak Academy of Sciences, with the university in Salford, England, the university in Essen, FRG and with the institute of Spectrochemistry in Dortmund, FRG. Within the framework of our common themes we are studying the oscillation of molecules with the aid of infra-red and Raman spectra, with a view to better understanding the structure-spectrum relationship.

The benefit of the congress to the spectroscopists working in this country is enormous. Bulgaria's candidature was approved at the last congress in Norwich, England, with full majority.

Interest in the present congress was very great. Some of the world's best specialists spoke about their latest achievements. Special mention should be made of the two Nobel Prize winners Prof. G. Herzberg and Prof. N. Bloembergen, Prof. Gribov from the USSR, Prof. Günthard from Switzerland, Prof. Fately from the USA, editor-in-chief of the *Applied Spectroscopy* journal, Prof. Narahan Rao also from the USA, editor-in-chief of the *Journal of Molecular Spectroscopy*, and many others.

At the time of the congress a small exhibition of spectral apparatuses was organised. Two firms displayed the latest in the sphere of infrared spectroscopy - Perkin-Elmer from the USA and Bruker from the FRG.

## Arms Agreement

Sofia SOFIA NEWS in English 5 Oct 83 p 8

[Comment to SOFIA NEWS by Prof Nicolaas Bloemberger, 1981 Nobel Prize laureate, Division of Applied Sciences, Harvard University]

[Text] Truly the gift of creativity is most important both in art and in science. Both art and science are disciplines which require long hours of practice and hard labour. It is often said that a prize is 1% inspiration and 99% perspiration. What one needs is a combination of a very hard work and in addition good luck then to do the extraordinary thing. So I would say that there are important parallels between science and art.

As far as the future of the molecular spectroscopy is concerned, I think the field is still very active as you see at this conference today. There will be new developments with increased application of lasers to

the field of molecular spectroscopy which will lead to more precise measurements and one can also follow reactions in very short time scales.

In real life spectroscopy is applied indirectly. If you look for instance at two important fields of molecular spectroscopy, nuclear magnetic resonance and laser spectroscopy, one sees lasers being used. They didn't exist 23 years ago. Most of today's laser applications have been for peaceful purposes and lasers have greatly aided improving medicine and communications, lasers are used by biologists in increasing numbers in biophysics and bio-chemistry.

It is true that lasers can be also used as weapons. I hope

that the big powers can come to an agreement not to deploy these big weapon systems.

There are many groups in the USA who are very active in trying to come to an arms agreement and I believe that they are being listened to. It is quite clear from past history that this is a long and difficult process. But we should keep working for further agreement on arms limitations and arms reductions by every possible means we can. Now it is not just putting a signature to a declaration - there should be a large scale movement in the countries. This is what the people want. I think we must look forward to further arms agreement in the future.

## Significance of Spectroscopy

Sofia SOFIA NEWS in English 5 Oct 83 p 8

[Text] The spectacular successes of modern science are due to many reasons. One of them is unquestionably man's successful penetration into the micro-world. In the past, scientists had to fathom the structure of molecules and atoms with the aid of hypotheses and inferences, today they can avail themselves of methods and devices which enable them to attain exact, experimentally confirmed knowledge regarding the tiniest component parts of matter and their interaction.

One of these methods is spectroscopy, which examines the interaction of molecules with different kinds of radiation.

There are several types of spectroscopy. The study of molecular spectra can in many cases determine the exact structure of a molecule, the spatial position of the atoms, the distances between them, as well as the distribution of the forces of interaction between them.

Molecular spectroscopy is of major significance not only to physics and chemistry, but also to different practical spheres. Thus, spectroscopy can be used to determine the age of archaeological finds, different surfaces, etc. It also finds application in forensic medicine.

Molecular spectroscopy is also finding more applications in

daily life. Many people use products of pharmaceuticals whose development is near impossible without spectroscopy – the nuclear magnetic resonance, to be exact. Spectroscopy is also increasingly being used in food testing and the control of their manufacture. Everyone likes tasty food and good drinks, but the components responsible for the taste are contained in minimal quantities which can only be discovered with the aid of super-sensitive spectroscopy.

These were just a few examples which provide an image of the extremely broad sphere of application of spectroscopy. (SN)

[Articles compiled by Krassimira Ikonomova]

CSO: 2020/14



VAMOS CALLS FOR HASTE IN DEVELOPMENT OF INFORMATION NETWORK

Budapest MUSZAKI ELET in Hungarian 26 May 83 p 4

[Debate initiating speech by Tibor Vamos: "The Information Infrastructure of Society"]

[Text] Academician Tibor Vamos started the debate about the social effect of the development of information technology at the meeting of the technical department in the combined department sessions preceding the general assembly of the Academy. We are publishing almost the full text of the debate initiating speech.

A 20 minute comment cannot be a lecture. I cannot add much that is new about the theme to my article in the November 1982 issue of MAGYAR TUDOMANY and the study which appeared in the April issue of VALOSAG, so I would like to call attention only to a few supplementary items which might give a basic note to the social aspects of the sphere of thought.

The separation of the social sciences and information technology is a harmful social phenomenon. I might give three examples of how deeply this unfortunate phenomenon is rooted in the reality of our society. The first is that in parallel with the present session, our meeting today, the social science departments are holding a series of lectures about questions, the existing questions, of Hungarian reality. The organizers somehow thought that these two themes were most distant from one another and so they could be held simultaneously. This shows the academic view.

The second example is the matter of telephones and communications. I believe that it is correct to state and propagate the view that the backwardness, the catastrophic backwardness, of the Hungarian communications and telephone system is not the consequence of the general development, developmental level or poverty of the country. In socialism and capitalism alike a substantially more developed information infrastructure is found in comparison to our per capita national income. One could give a good many more examples, in addition to the current central committee series of examples, of investment campaigns the economic and social profit of which was much smaller, and where the consequences of backwardness would have been much smaller than the long range

destructive consequences of our profound infrastructural backwardness in the area of telephone and information technology.

#### They Considered Feedback Unnecessary

This is the result of a social view, not of economic policy. It is the consequence of a social view which did not recognize that information technology, communications, is a self-organizing force of a modern society. The erroneous view built on earlier economic structures and started from a rigidly hierarchic form of thinking. This view thought in information chains flowing in only one direction, from the top down, to such an extent that even in the area of production it considered feedback unnecessary; and so even in the area of social life, of social activity as a whole. It considered the creation of information networks--in which every social unit and individual could communicate with others, which is a basic condition for a modern production and social structure--to be dangerous and harmful, something which could be avoided. So our backwardness in the area of information is a consequence of this way of thinking.

I believe that it is very important to call attention to this circumstance, simply in the interest of the lessons of the future. In a way which can be easily seen by every Marxist the gap between social thinking and technology means, sooner or later, serious social tensions.

#### The Effect of Groups Considering Themselves Competent

The third example is the lack of comprehension which can be experienced in connection with the formulation of the information law. The proposal was born more than 2 years ago. Politics understood the necessity of the formulation of the law, but groups in state administration which thought themselves competent did not understand the timeliness of the regulation. They found that the decrees passed in this regard years ago--not laws, but only general decrees--completely satisfied the future needs of society. Thus they are delaying with quiet resistance the creation of the information law--a comprehensive information law which might be capable of regulating better and in a more modern way the various producing and other organizations of state and society, the information relationships of organizations and between individuals.

#### It Is Incorrect to Speak of an Information Society

Again we have to do with a serious backwardness of view. The question justly arises whether the society which comes into being with the progress of information technology and which some western authors try to call the information society will be of a different sort than the society of today. The extreme form of the question in this connection is whether this is a socialist or capitalist phenomenon. As a first observation I would like to emphasize that it is incorrect to speak of an information society, although the significance of information technology will be paramount in it. Just as today we do not speak of an industrial society, despite the fact that even agriculture has been transformed and industrialized. We are talking about a

modern social production structure, in which the role of agriculture has changed in many respects and in an extraordinary way. Similarly we should not speak of an information society when information appears not in itself and for itself but rather as a general organizing force of society, embracing agriculture and industry, and when society, naturally, will be qualitatively different. But I consider it incorrect to ask whether this is a socialist or capitalist phenomenon. Fortunately socialism is a social form with an enormously broad spectrum and it is today not blasphemy to anyone if we say that socialism in Hungary differs rather greatly from what they mean by socialism in, let us say, North Korea. In a similar way we can talk about rather different characters of capitalism in the case of Sweden, a Latin American dictatorship, a central African republic or an empire. If there are differences of this scale within a social system then we can think tranquilly of the prospect that that society which organizes itself with the progress of information technology will be qualitatively different from the one that is at a lower level.

What sort of differences am I thinking of? They include to a very large extent a transformation of work culture, of organization culture. They include several new questions of freedom and constraint, of personality and social cohesion which would be truly formulated for society for the first time in connection with, for example, an information law. These contradictions always existed parallel with the development of societies and they will continue to exist; we must always face them at the given technological and social level, bravely and composedly--a problem which cannot be swept under the rug. The social division of labor will change also, the ratio and weight of strata performing different tasks within society will change; their entire behavior, way of life and expectations in regard to society will change.

#### Communities May Take on Richer Forms

We must recognize the fact that the society of the 1980's has a different composition, a different "emphasis," a different character than the society of 30 years ago. There arise many contradictions of the enrichment and impoverishment of the personality. So far this has become well known primarily in the debates about the role of television--the extent to which society is becoming intellectually passive and the extent to which the general receptivity of society, the general information level and culture of society expand as a result of television. A similar problem, for example, is the decrease in writing, the ability to express oneself in writing, the change in communication between people, the change in the passive and active roles of people in work itself. The questions of the breaking up of communities and the development of new communities are becoming equally profound social questions--and we must constantly deal with them.

On the one hand a society organized by information creates extraordinary new opportunities for communities to be able to take on much richer forms, whether in the form of more direct democracy or in the form of an emphasis on person to person contacts. At the same time, in a visible way, the traditional communities of society are breaking up and changing.

## The Investment Which Pays Off Most Quickly

I would like to call attention to one factor. The technological solutions connected to flexible manufacturing systems and networks, the closed large factory structures which characterized the end of the last century and the first half of this century--and which were progressive structures in their time--will go through a new significant transformation. We must deal with the social and sociological consequences of this.

Finally, in conclusion, let us return to the practical background of our current tasks. We must prove to the economic leadership of the country and to the public opinion of the country that despite all our difficulties, indeed because of them, the country must make radical progress in the area of information technology. Let us look, for example, at the work time lost to people and to society, because of the poverty of information technology. (And now I am talking not only about the difficulties of official contacts, of telephone contacts, but also about how much work time is lost in connection with the old style of dealing with the affairs of workers.) This must be sacrificed from free time on the bad altar of a bad social organization. In contrast to this these energies could be used partly for rest, partly for culture and partly for extra production. According to various estimates the total social product could be increased by 10 percent only by changing the information technology--otherwise at the same technological level. I believe that this figure is extraordinarily underestimated. If 10 percent of the Hungarian national income is lost in this way and if we compare this to the sum which would be needed for investment then we can see that at the moment, certainly, the development of this branch would be for Hungary the investment which would pay off most quickly. In this spirit we must take the offensive for the development of information technology and in this spirit we must try to formulate that national program which was outlined at one of the most recent sessions of the state planning committee. Namely, a well organized national program must be started for the social propagation in Hungary of interdependent systems of computer technology, communications, electronics and automation and for all the technical and social tasks connected with this.

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DEVELOPMENT, USE OF MICROCOMPUTERS IN HUNGARY

Budapest INFORMACIO ELEKTRONIKA in Hungarian No 4, 1982 pp 184-186

[Article by Karoly Stuka: "Domestic Development and Use of Microcomputers"]

[Text] The backwardness in domestic use of microprocessors as compared to developed capitalist countries (4-5 years) may be less than in computer technology in general. In addition to analyzing the factors that disturb development, the article reviews the leading domestic applications, which are based primarily on the 8080, Z 80 and 6800 processors. It reports on the coordination to be expected in the area of microcomputers and applications. (Arrived 15 Apr 82)

The microcomputer explosion has also begun in our homeland in the last 1-2 years and we may now be in the most expansive phase. In such a phase it would be a most risky undertaking to write an analytical article about this theme. I would like to say in advance that I did not write this review of the domestic picture or the ideas pertaining to the future in the false belief of completeness or absolute correctness.

Nor do I intend to burden the article and the readers with a characterization of the explosion which has taken place in the area of microprocessor devices--at what rate the number of elements in one chip has increased, how their price has decreased, how the price/performance ratio is developing, etc. These figures and data are truly breathtaking and shocking and must prompt experts in the field to think. But these things can be found in many articles in the professional literature and the daily press, so I consider it unnecessary to repeat them.

In our homeland we began to deal seriously with the use of microprocessors after a 4-5-year delay as compared to the developed capitalist countries. So the lag is smaller than in computer technology or the electronics industry in general. But there are a few phenomena which disturbed and still disturb development and which may lead to increasing our backwardness. Most significant among these is the fact that in the field of microcomputer technology there is no market or commercial mechanism which would be necessary for the social penetration and spread on a scale which can be found in the developed countries.

The lack of a commercial mechanism applies equally to parts supply, readily available building elements, subassemblies, microperipherals and other accessories. Everyone is using what he can get in some way. It is because of the lack of commerce that we have no microcomputer amateurism either--although in my opinion there is this amateurism only within institutional, faculty or enterprise frameworks. (I am not thinking here of the professional level of the workers but rather of the conditions and supplies with which most of them work.)

There is one parameter in which we certainly exceed the most developed country--microcomputer development work per capita. According to estimates there are more than 200 developments, the goal or achievement of which can be regarded as a microcomputer, and only rarely do we find anything common among them. In general everyone is discovering the same things in turn. The end result is suggestive of amateurism--just as radio amateurs progressed from a crystal set to a 2+1 tube set, so here also we have created mostly processors programmable in machine code and lacking peripherals.

Naturally, the picture is not quite so dark. In a number of places they have dealt and are dealing with the theme in such a way that the final result of the development could be regarded as a product. They have gotten this far most recently in the research institutes and in our institutions of higher technical education.

In the Central Physics Research Institute [KFKI] of the Hungarian Academy of Sciences [MTA] they dealt primarily with the creation of microprocessor elements increasing the intelligence of the CAMAC system and with applications in industrial measurement data collection. Microprocessors are used in a number of places in their computer technology products.

In the Computer Technology and Automation Research Institute of the MTA they produced microprocessor machinetool controls and technological process control systems. They developed a microcomputer to control computer networks and the GD 80 graphic display family based on microprocessors.

The Computer Technology Coordination Institute [SZKI] was among the first to move in this direction and in 1974-1975 they prepared the MO5X microcomputer family the most significant application of which is control of marshaling yards with small or medium traffic. The SZKI takes a significant part in developments taking place within the framework of MSR [Mode Status Register] international cooperation activity and it also has an important role in coordinating domestic developmental work.

At the Instrument and Measurement Technology Faculty [MMT] of the Budapest Technical University they developed, among other things, the MMT system, which provides a complex assortment of technological elements for creation of various ad hoc or small-series microprocessor systems in the area of the instrument industry, industrial measurement and process control.

The Electric Power Industry Research Institute [VEIKI] is dealing with the development of microprocessor process control computers.

The Signal Technology Industry Research Institute [HIKI] developed an automatic microprocessor electronic measuring device.

The Textile Industry Research Institute developed its own microcomputer and realized a number of light-industry applications on the basis of it.

Broad work is also being done in several branch research institutes in the area of microprocessor and microcomputer applications. Partly on the basis of the achievements of the above-listed institutes and partly on the basis of their own developments a number of enterprises have added to their profile the manufacture of systems using microprocessors. Naturally this applies to those producing computer technology products:

The Videoton Computer Technology Factory uses microprocessors in its new terminals and computers. The VT 20 and VT 30 microcomputer systems can count on great popularity.

In addition to the multiplexor based on a microprocessor, the Telephone Factory is planning to introduce manufacture of an intelligent terminal family and financial terminals.

Microprocessors are used in the terminals and remote processing devices of the Orion Radio and Electric Enterprise.

Enterprises not having a computer technology profile are dealing with this theme also:

The MEDICOR Works might be mentioned first; it will manufacture elements of the MMT system developed at the Budapest Technical University.

VILATI [Electric Automation Institute] is dealing with an industrial electronic control system based on a 16-bit microprocessor; in addition it manufactures microprocessor cashier and reservation systems for the Soviet railways and data transmission equipment.

The MMG [Mechanical Measuring Instruments Factory] Automatic Works has developed microcomputer systems for efficient and reliable performance of specifically industrial automation tasks.

The VBKM [Electrical Equipment and Appliance Works] has developed a microprocessor element family to replace relay circuits.

Large numbers of microprocessors are used in the machinetool controls and other products of the EMG [Electronic Measuring Instruments Factory].

The BRG [Budapest Radio Technology Factory] has sold a large number of ABC-80 microcomputers for educational purposes.

As I said already, the list cannot be complete because the inclusion of a microprocessor in some piece of equipment is less and less a novelty and more and more a requirement of the age. Those mentioned are those closest to computer technology.

I cannot list the many civil law associations, economic work groups and TSZ [producer cooperative] auxiliary plants where they frequently produce products offering better and more complex services because the excessively long press throughput of the journal makes it impossible to follow the proliferation in this area. (Perhaps the teletex system will make this possible in the future.)

So the picture is colorful enough and well illustrates that the broad industrial and social spread of microprocessors has begun for us also. We might regard the rich proliferation and many-sided experimentation as a more favorable phenomenon in the initial phase of the process, when knowledge is being accumulated, because a broad social spread requires a large number of understanding experts. Now, however, we have reached the point where further spontaneous development might lead to economic damage and anarchy. The organs dealing with central coordination of research and development have decided to try to turn domestic microcomputer development and applications work into a more uniform bed with the tools at their disposal. Naturally turning them into one bed cannot mean force or prohibition, but rather--in keeping with our practice thus far--it means giving preference to some trends over others. There is certainly need for a certain unification. Just as there was need for the metric screw, uniform railway gauge, 220-volt current and the development of standards for wall sockets and electric plugs for the mass spread of applications, so in the area of microcomputers we must create standards pertaining to interfaces, bus systems and operating systems.

An essential element will be establishing standardization in the parts base. According to the most recent surveys, 52 percent of the domestic applications use an 8080 base while 38 percent use a Z-80, 6800 or 8086 base. This would not be bad, because these types already exist in the socialist relationship too. But the picture is much worse if we also take into consideration the supplementary circuits. It is of crucial importance that, in harmony with the largest users, we rationally develop in domestic inventories and trade a narrower assortment of parts than at present, one which can be guaranteed in a short time and over the longer run.

With regard to conditions reigning among microperipherals we can really only use the word lamentable. On the basis of their prices even the existing microperipherals cannot be listed in the micro category. Users are affected most sensitively by the lack of printers at a suitable price, for they would need readable reproduction of the entire Hungarian letter set. Something must be done urgently to ensure a suitable price level for microperipherals. The auxiliary plants and economic work groups might help but the initial indications suggest that the process might run in the opposite direction--they will not bring down the present prices but rather will try to boost the prices of their own products to this level.

Frequently it is not useful to develop microprocessor systems on the microcomputers themselves, where the peripheral supply, storage capacity and available language and other tools are not most suitable for this. The so-called MDS (developmental systems) serve developmental purposes; either they have a microprocessor solution themselves or they are cross-systems running on a larger machine. The situation is complicated here too, and not because there



are few such developmental systems. I know of an institute where they are making one or two cross-systems for the same microprocessor on virtually every floor, each independent of the other. Very many independent systems have been prepared also. Several collectives first made their own MDS and then began development of the target system, but these did not reach the level of a product. We can say the opposite, perhaps, only of the UMDA [expansion unknown] prepared at the KFKI, the developmental system belonging to the MMT and the developmental system of the EMG.

As I mentioned already, a certain coordination can be expected in the area of microcomputers and their applications. In the interest of successful coordination we must concentrate on well-circumscribed equipment categories. At present the following three categories seem useful:

microcomputer systems for mass use--essentially the personal computer category;

an assortment of elements needed to put together equipment for automation, process control and control of medical and other instruments (such as the abovementioned MMT system);

independent computer technology applications, which take their place above the upper limit of the microcomputer category.

With a concentration of resources we will surely achieve a swifter and more uniform development of these three categories, which will have an effect on the level of applications also, because in the opinion of experts these three categories are capable of covering a sufficiently broad sphere of user needs.

Coordination will extend to the use of certain model systems and user experiences and to the creation of developmental collectives, guidance systems for small industrial enterprises and cooperatives in the areas of agriculture, health affairs, technical-scientific information, machine manufacture and electric automation.

Multilateral international cooperation in the area of the application of microcomputer systems has begun at a swift pace within the framework of the Scientific-technical Cooperational Committee of CEMA and the SZKB [Computer Technology Inter-government Committee]. Hopefully this cooperation will soon make its favorable effect felt. As I mentioned in the introduction, it is difficult to make longer-range predictions on this theme during the present phase. I have limited myself to describing the present situation and the development to be expected in the next 1 or 2 years. It is certain that a coordination program agreed upon with the participants will help us keep up with the tempo of this dynamically developing area, because this will have an effect on the development of the economy as a whole as well.

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CSO: 2502/82

## VIDEOTON REMOTE PROCESS TERMINAL

Budapest INFORMACIO ELEKTRONIKA in Hungarian Vol 17 No 4, 1982 pp 206-213

SARKOZI, ENDRE, and GROF, JOZSEF

[Abstract] The Videoton Computer Technology Factory has developed a microprocessor terminal which are intended primarily for use in computerized decentralized process control systems but which can also be used independently. Manufacture of process control systems began in 1971 on the basis of license purchase. In 1972 they switched from DTL circuits to TTL integrated circuits and began to expand the family of process peripherals. The appearance of microprocessors in 1974 made possible the development of decentralized systems. The Remote Process Terminal (RPT) can be kilometers distant from the central computer; analog and digital I/O modules serve the process instruments; it has an operator display and matrix printer. An X-Y graphic device and fast minicartridge cassette for data recording can be attached. The control unit contains CPU, RTC, REPR0M and RAM expansion units. Auxiliary batteries prevent loss of RAM contents in case of power failure. Storage capacity can be expanded to 64 K bytes. Data transmission can be 50-600 Baud on a physical line, 600-9,600 Baud on a data transmission telephone line or up to 500 K Baud on a coaxial cable. The Videoton programs run on an ES 1010 computer. As a terminal the RPT can be used in mining and petroleum and natural gas production to control oil, water or electric lines in extensive industrial plants or for water affairs, environment protection and meteorology. As a unit standing alone, it can be used for laboratory measurements, machine-tool control, final checking of products or process control. It is used in the Tyumen oil fields of the Soviet Union, in the Beremend Cement Factory and in a laboratory of the Szeged Medical University.

Figures 4; references 2, US.

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## TELETERM--A PROGRAMMABLE, SIMPLE TERMINAL FAMILY

Budapest INFORMACIO ELEKTRONIKA in Hungarian Vol 17 No 4, 1982 pp 214-217  
manuscript received 19 Feb 82

GSABAI, BARNABAS, and FAJNOR, IVAN

[Abstract] More extensive use of computer technology could be made if users had to buy only the modules needed at the time and if operation were based on answering the questions appearing on the screen. These considerations prompted development of the TELETERM family introduced at the spring Budapest International Fair in 1981. The simple terminals have a 12-button telephone keyboard (with a maximum of 16 other keys), a transmission speed of 1,200 Baud and an 8-40 alphanumeric character LED, LCD or gas plasma display. Storage can be as high as 16 K bytes RAM and 16 K bytes ROM. They can be used as programmable terminals in a remote processing net or as terminals in a data collection or production control net. The first modified versions of the TELETERM have been used in the laboratory system of the Peterfy Sandor Street Hospital, the Signal Technology Cooperative being prime contractor. A line code reader can be attached for warehouse, library or personal identity card applications. The modular software includes a set of standard routines. A line-handling algorithm makes possible a connection to any computer without modifying user programs. Even in small-series production the cost of the basic TELETERM hardware should not exceed 40,000 forints.

Figures 2, no references

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PUBLIC DATA NETWORK OF THE HUNGARIAN POST OFFICE

Budapest INFORMACIO ELECTRONIKA in Hungarian Vol 17 No 4, 1982 pp 218-222  
manuscript received 27 Nov 81

UHRIN, PETER

[Abstract] On its new line-connected data network the Post Office provides not only a transmission path but also a digital interface by installing DCE equipment at the data station. This interface meets the CCITT X 20 and X 21 standard. Most of the equipment now in use is for interface circuits in the 100 series as set forth in the CCITT V 24 standard, so the Post Office also provides a V interface DCE and an NCU for V/X transformation. Duplex transmission is possible on the data channel of the data network and half-duplex terminals can be used without change. The data center also handles the earlier established DATEX network, the Post Office providing a DATEX DCE to subscribers. The DTE interface procedure established when the data station is put in operation should not be deviated from without notifying the Post Office.

Figures 4, table 1, no references.

8984

CSO: 2502/82

## ELEKTRONIKA-60 MEMORY EXPANSION

Budapest MERES ES AUTOMATIKA in Hungarian Vol 30 No 6, 1982 pp 222-226  
manuscript received 17 Feb 82

RISZTICS, PETER, Dr, Process Control Faculty of the Budapest Technical University, and KOVACS, ENDRE ATTILA, Signal Technology Industrial Research Institute

[Abstract] The Elektronika-60 microcomputer can address 32 K words (64 K bytes). The 16-K-word version provided by the factory is too small for many applications. It can be expanded with 4-K-word memory cards but maximum operating store cannot be attained without supplementing the original rack. The Soviet KPY 556 memory, compatible in its specifications with the widely used MOSTEK 4116 memory element, was used to create a 32-K-word memory card. This chip has 16,384 memory cells which must be refreshed every 2 ms. The timer controlling the refresh in the 32-K-word dynamic RAM card is placed on the memory card, using the asynchronous mode and arbitration logic, thus relieving the burden on the system bus. This has the advantage that from the outside the dynamic RAM card can be handled as static memory. Final testing of the new memory was done with a factory test program provided for the Elektronika-60 system. The RAM card worked perfectly during 8-9 hours of tests despite the noisy laboratory environment. Figures 4; references 5: 1 Russian, 4 U.S.

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CSO: 2502/79

## DATA RECORDING AND PROCESSING PROGRAMS OF THE MB-9101 DATA PROCESSING AND IMAGE PRESENTATION SYSTEM FOR SPECIAL CARDIOLOGIC EXAMINATIONS

Budapest MERES ES AUTOMATIKA in Hungarian Vol 30 No 7, 1982 pp 267-269  
manuscript received 14 Apr 82

BILLING, ADAM, Dr, Gamma Works, CSERNAY, LASZLO, Dr, Szeged Medical Sciences University, CSIRIK, JANOS, Attila Jozsef Science University (JATE), MAKAY, ARPAD, JATE, and MATE, EORS, JATE

[Abstract] The Gamma Works manufactures, on the basis of a license, the detector part of a scintillation gamma camera and developed on its own a computerized data processing system for picture evaluation. Special, medically oriented programs were developed by the Central Isotope Diagnostics Laboratory of the Szeged Medical Sciences University. Thus far 55 such devices have been made, 18 of which are used in Hungary and more than half of which are used for cardiologic examinations. It was necessary to prepare 15-20 pictures per second. The digitized picture is made up of 64 x 64 points, about one-third of which form a useful picture consisting of 1,200-1,500 cells. Each picture means detecting about 150,000 decay impulses. A synchronizing signal is given for every R wave of the EKG unit, permitting storage on disk of lists of X, Y coordinates. A disk is filled in a couple of minutes; the decision to use additional disks is based on information provided by a preprocessing program. The examination can be evaluated immediately after completion of data collection. For statistical reasons there must be a compromise between the number of pictures and the impulse content of each picture. In general 8-16 pictures permit a study of the movement ability of the left chamber wall. The SUPER-SEGAMS software system has two programs written in FORTRAN. Local changes in movement ability indicate pathological changes in the left chamber wall surface. The series of pictures thus produced can show heart wall movement as in a film. Figures 3.

8984

CSO: 2502/78

## A COMPUTER FAMILY WHICH CAN ALSO BE MICROPROGRAMMED BY THE USER

Budapest MERES ES AUTOMATIKA in Hungarian Vol 30 No 8, 1982 pp 298-305  
manuscript received 12 May 82

AMBROZY, GYORGY, MISKOLCZI, JANOS, Dr, SZABO, IMRE, and VAJDA, FERENC

[Abstract] The TPA 11/EMU computer system is a further development of the TPA/11 system. It is a universal emulator using bit-sliced microprocessors. It has 18-bit addressing and with the aid of a memory management unit can address 248 K bytes of operational memory and 4 K words of I/O registers. The cache memory option can be used as an operating store or microprogram (WCS) store and can increase system speed by 30-60 percent. A microprogram development system (and supporting hardware) meeting modern firmware engineering requirements was developed to prepare user and manufacturer microprograms. Applications program kernels can be implemented in microcode and vertical migration of parts of the operating system can be realized with the aid of a microprogram. Firmware monitor programs are available. The TPA 11/EMU, which is program-compatible with the TPA 11 computer family, was prepared in two versions: the TPA 1140/EMU without memory management unit, with a maximum storage capacity of 64 K bytes, and the TPA 1134/EMU with memory management unit, with a maximum storage capacity of 256 K bytes. Software and hardware tools make possible the writing and testing of microprograms and the loading of them into control memory (PROM or RAM). The programming aids are suitable for processing symbolically written microprograms. The TPA 11/EMU can be used as a general-purpose computer, as a microprogram development device, as an intelligent microprogram emulator and as a research device to speed up operating systems using microprogramming and to implement microprograms in the intermediate code of high-level languages. Figures 8; references 15: 13 Hungarian, 2 West European.

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CSO: 2502/77

## A MICROCOMPUTER-CONTROLLED COLOR PICTURE PROCESSING DEVICE

Budapest INFORMACIO ELEKTRONIKA in Hungarian Vol 17 No 2, 1982 pp 64-68  
manuscript received 14 Dec 81

ALLO, GEZA, Dr

[Abstract] Picture processing has been studied in Hungary since the beginning of the 1970s and SZKI (Computer Technology Coordinating Institute) is one of the bases of software development. It also developed a color digital picture display unit. The HT-680X microcomputer of the Signal Technology Cooperative was found most suitable for controlling the display, thus giving birth to a color display processor (CDP), a hybrid picture processing device combining the most recent achievements of digital computer technology and analog (television) technology. The Signal Technology Cooperative has undertaken manufacture of the CDP; SZKI produces the software. The CDP can be used alone or as a basic module of larger systems. In the interest of processing large volumes of information or increasing processing speed it can be connected to various small computers such as the ESZ 1011 or TPA 11/40. The CDP can process and display pictures taken from video camera or tape or generated by a computer. The main memory of the microcomputer, consisting of both RAM and ROM modules, is 512 K bytes and can be expanded to 1 M bytes. Only 64 K bytes (of which only 32 can be RAM) can be addressed at one time. The other chief modules are the CPU, DMA, PIA and ACIA, and one can add APU, a "Kansas City" magnetic tape connecting unit and UI/O. The color picture display (CD) digitizes incoming analog signals. Every picture point corresponds to a byte in refresh memory, storing in 6 bits the code determining the gradation of the picture point. This code controls the color signals of the monitor. A maximum of 25 pictures can be received or produced per second. The standard color monitor is a raster point display which breaks the picture into 625 lines. After digitizing the picture consists of 288 by 384 picture points. The peripheral units include the COROLLPRESS-4 drum device developed by the ELGI and manufactured by GAMMA in Hungary which draws a color picture consisting of 2,048 by 2,048 points on 40-square-centimeter common paper in about 20 minutes. The basic picture-processing software consists of IMAGE, which displays, magnifies, reduces and transforms pictures received from a camera or host computer, and COGRAPH, which generates simple graphs and drawings. The CDP can be used to process medical slides or X-rays and produce TV text displays (even in Hindi or Arabic), as an optical reader storing the code of identified characters, to



process space or aerial photographs, or in engineering design. The CDP won the grand prize at the Budapest International Fair in the spring of 1981. It is a unique item on the socialist market and is competitive with similar Western equipment thanks to its technical parameters, the programs available and cheap price. Figures 3.

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CSO: 2502/81

## RURAL NETWORKS

Budapest HIRADASTECHNIKA in Hungarian Vol 34 No 3, 1983 pp 97-101  
manuscript received 22 Jun 82

BERCELI, TIBOR, Dr, Telecommunications Research Institute, LAJTHA, GYORGY, Dr, Postal Service Experimental Institute, and TOFALVI, GYULA, Dr, Telecommunications Research Institute

[Abstract] There are 10 subscribers per square kilometer in Hungary; in Budapest there are 1,000 subscribers per square kilometer and in the typical rural district only 1 or 2. The modern solution for a rural network uses time-sharing digital transmission for both voice and data. The transmission devices are primarily digital equipment based on the PCM hierarchy. Domestic research plans follow the developmental trends for rural networks. The OKKFT [National Medium-range Research and Development Plan] A/5 and the OTTKT [National Long-range Scientific Research Plan] K8 have significant tasks in the development of rural equipment in the present 5-year plan period. These include development of the PRS rural equipment family, development of a subscriber microwave system (radio links between a main station and at most 10 substations at a speed of 0.7 M bits per second with PCM bundling), further development of the frequency distribution radio telephone system manufactured by the Budapest Radio Technology Factory, development of small-capacity digital microwave links and use of existing analog equipment for rural networks. Domestic industry should be ready to manufacture equipment with which the delivery of complete rural networks can be undertaken by the end of the plan period. Existing backwardness and investment limitations might be overcome by bringing in associations of people and production units in the affected areas to share the work. Construction might be the task of local councils. Local people might be trained to replace faulty units and send them to postal shops for repair. The local councils might organize associations which could take out bank loans for community systems under postal supervision. From the viewpoints of money, manpower and organization the rural network accounts for two-thirds of network development. If this two-thirds could be shifted to the subscribers, development in general might be speeded up three times. There have been examples of this in Finland, Italy and Greece, and in 1982 the creation of rural networks in the United States was taken from the hands of ATT. References 12: 2 Hungarian, 2 German, 3 U.S., 5 CCITT (Switzerland).

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## SCIENTIFIC COMPUTATIONS WITH LARGE DATA BLOCKS IN SMALL COMPUTER SYSTEMS

Budapest HIRADASTECHNIKA in Hungarian Vol 34 No 3, 1983 pp 109-113  
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FORRO, TIBOR, Central Physics Research Institute

[Abstract] Some scientific computations require several million floating point operations per second (seismic measurements, weather, etc.) and few general purpose computers can do this. Manufacturers offer floating point arithmetic processors where faster arithmetic operations are required. The computer calls up commands, calculates addresses and transmits operands while the floating point processor does the floating point operations. But many scientific computations (matrix operations, linear transformations, correlation analysis, etc.) require only simple control and address operations. The control tasks could be done faster with a much simpler device. This gave birth to vector processors, which are combinations of one or more high performance arithmetic units and a simple but fast control unit. Examples are the MAP 100, 200 and 300, members of the vector processor family of CSP Inc., the AP 120 B vector processor of Floating Point Systems and the MSP 3 vector processor of Computer Design and Applications Inc. Development of a floating point vector processor has begun at the Central Physics Research Institute to make the TPA 11/440 small computer suitable for handling algorithms requiring numerous arithmetic operations. The vector processor is connected to the fast, 32-bit bus of the computer. Both multiplication and addition units have a two-step, pipeline organization. It is possible to carry out 4 million floating point operations per second. The cycle time of both program and data memory is 160 ns. The programming of vector processors is done with 64-bit program words. Figures 9; references 4: all U.S.

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## EQUIPMENT-ORIENTED INTEGRATED CIRCUITS

Budapest HIRADASTECHNIKA in Hungarian Vol 34 No 3, 1983 pp 114-117  
manuscript received 22 Jul 82

ERDELYI, JANOS, Budapest Technical University, Electronics Technology Faculty

[Abstract] On the basis of the government electronics program Hungary intends to prepare primarily for manufacture of equipment-oriented integrated circuits. An economical realization of the advantages of large-scale integration requires distributing the costs of design by manufacture of large series or finding a way to simplify design work. The obvious way to increase series size is to manufacture circuits which satisfy various user needs. The solutions available include programmable logic arrays, field-programmable logic arrays, hard array logic, programmable array logic, field-programmable logic sequencers and the stored program computers or Neumann automats, widely used in Hungary. A promising future development is an array of uniform sequential networks, or cell automats. These are not yet economical and programming for them has not been solved. Equipment-oriented circuits can be full-custom, semicustom or library custom. Design can be simplified by using master slice circuits and uncommitted logic arrays where only the last one or two layers need custom design. Use of array type circuits or gate arrays permit creation of finished circuits in 2 or 3 months. These are economical even with a series size of about 1,000. CMOS circuits appear most advantageous for Hungarian applications. If the circuit is suitably partitioned a ULA containing several hundred gates can be realized without computer support. One obstacle to the use of equipment-oriented circuits is the lack of Hungarian language sources. Figures 6; references 14: 12 U.S., 2 Hungarian.

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## DECENTRALIZED PARTY-LINE TELEPHONE SYSTEM

Budapest HIRADASTECHNIKA in Hungarian Vol 34 No 3, 1983 pp 121-125

KOLLAR, JANOS, Beloiannis Telecommunications Factory

[Abstract] Party-line and Asterisk systems produced by the Beloiannis Telecommunications Factory are used by the Hungarian State Railways and the National Petroleum and Gas Industry Trust and in a number of domestic and foreign dispatcher systems. A decentralized party-line system has been developed as a supplement to these systems. The system uses printed circuit cards, permitting easy maintenance and easy expansion of the number of substations. A stored program provides basic services. The maximum number of substations is 81, using 4 wire-amplified or unamplified circuits with a transmission frequency of 300 to 3,400 Hz. Conference calls can be made to a maximum of eight stations, plus the calling station. The first equipment was put into operation in September 1982 on the Siofok-Nagykanizsa line of the Hungarian State Railways. There are seven stations with two to four substations each. A 2-month test of the system proved that it provided all the prescribed services. The Hungarian State Railways now plans to extend the system to the Siofok-Szekesfehervar line in the first half of 1983. Figures 3.

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POOR QUALITY OF BUCHAREST DRINKING WATER

Bucharest MAGAZIN in Romanian 2 Jul 83 p 6

[Article by Mirela Roznoveanu]

[Text] Once it is utilized, the water which man uses for his daily requirements, good drinking water from the cities or the pure water from springs, wells and rivers, becomes used water. So man changes the quantity of clean, "healthy" water from the source into "used" water which no longer can be drunk or used directly as such, water which causes danger and damage once discharged into the rivers or infiltrated in underground water. For that reason, the methods for combatting and, in particular, preventing water pollution are indispensable, especially since clean water is not unlimited. But is this process possible? Will the society of the future gradually have to replace polluting technologies and substances in favor of other substitutes or, as pollution increases, will technology develop in proportion to it and will there be more and more complex methods to combat it? The need for us to adapt to the logic of the environment, the rational utilization of the ecosphere and the attempt to improve faulty types of production ecologically are stringent requirements of modern life being reflected today in Romania by technologies and legislation intended to protect water, the support of life.

Responsibility for the Water We Drink

The old Romanian saying that "water passes over seven stones," by which flowing water is refreshed and cleansed, no longer reflects the entire truth today, we were told by engineer C. Radescu, director in the National Water Council. The impact on water in modern society, through multiple sources of pollution, has exceeded its capacity to defend itself through natural phenomena of dilution and self-treatment. Man has a sense of duty to prevent pollution at the source, to conceive of less polluting technologies, since depolluting the water is becoming more and more difficult and costly. Actually, the speaker told us, we are encountering several specific forms of pollution. Organic substances, in particular included in waste water from

the cities, the zootechnical units, the food industry and some units in the chemical industry; inert materials in suspension, such as particles of waste or ore ejected from mining preparations; toxic substances (cyanides and salts of heavy metals as, for example, from the baths of metal coatings or non-ferrous ore preparations); or noxious mineral substances in solution, without being toxic (for example, sodium chloride makes water unusable in agriculture above certain limits).

Specific treatment procedures have been perfected for each of these groups of substances, except for the last one. In a broad sense these procedures also include making the sediment resulting from most of the treatment techniques less noxious. These techniques are being applied in the treatment stations, which are real plants using physical, chemical and biological processes which return the water to its initial quality and offer the opportunity to utilize some of the pollutants or the products which damage it. For example, biogas is obtained from organic sediments through fermentation in special reservoirs. Heavy metals can be recovered from others and so forth. But, as engineer C Radescu told us, in order to more clearly define the real outlines of the problem, we must specify that water also can be polluted by the use of fertilizers and pesticides in agriculture with insufficient care and they often are involved in the underground tables or rivers. So water pollution is also closely connected with soil pollution and air pollution.

#### Our Health Also Depends on Healthy Water

The problem concerning water protection in Romania has been brought to our attention early, which overall has brought the training of specialized cadres as well as the development of technologies, equipment and apparatuses through our own possibilities. A network of laboratories has been created to supervise water quality and the system of automated monitoring stations, of Romanian design and manufacture.

It is worth knowing that around 10 billion cubic meters of used water are discharged annually in Romania's rivers. Of this amount, around 6 billion cubic meters do not have to be treated, since it is a question of cooling waters and of the little water which has not been polluted by use. Of the remaining approximately 4 billion cubic meters which must be treated, about 30 percent is treated sufficiently. Approximately 40 percent is not treated enough and around 30 percent is not treated at all. As yet this partial solution is the result of the fact that, unfortunately, the same importance is not being given everywhere to protecting water quality. Although the state allocates large investment capital exceeding 1.5 billion lei annually, the funds allocated are not used completely and they are not used for the planned water treatment installations. For example, last year just 61 percent of this category of investment was carried out. On the other hand, although around 3,700 treatment stations currently exist, not all of them are being operated at the parameters forecast. Many of them, like the ones in the municipality of Pitesti or at the Fagaras Chemical Combine, can be given as a model of concern. However, around 1,400 of them are not being utilized at their parameters, either because they have not been developed by the ministries

or people's councils concerned together with the particular project or because they are not being maintained appropriately. At the middle in these cases is the insufficient conviction of certain responsible or operations factors regarding the importance of the problem, which causes water protection to be left in the background compared with other requirements which, without correctly estimating the shortcomings untreated used water can cause for health, for the environment and for economic efficiency. As a result, difficulties have appeared in some areas of the country in supplying drinking water, industrial water and water for irrigation. To give several examples, the Carbosin Enterprise in Copsa Mica and the Copsa Mica IMMM [expansion unknown] are polluting the Tirnava Mare River, causing difficulties in supplying Blaj with water. There are difficulties in Buhusi and Bacau due to the insufficiently treated water being discharged by the Savinesti Synthetic Fiber Combine, the Piatra Neamt Chemical Fertilizer Combine and the "Reconstruction" Cellulose and Paper Enterprise in Piatra Neamt. At the latter, more decisive measures have recently shown that it is possible to take effective action if good will and perseverance exist. All the treatment stations will be perfected by 1990 by implementing the provisions of the program adopted to eliminate lags in the area of treatment of used water.

The increase in actual water consumption has led to a reduction in the available quantities of water in the rivers. The quantity, number and chemical complexity of pollutants have risen and continue to rise. It has become clear that under present conditions water usage must be a directed process. The measures taken in the recent period, including introducing the water balance into the national economy, the water consumption norms per unit of product and quality indicators of used waters as plan indicators, are intended to check waste and pollution.

#### Do You Know How Expensive Water Is?

Since water does not always fulfill all the conditions for being consumed, Prof Dr Sergiu Manescu, director of the Institute for Public Health and Hygiene, told us, in the last 10 years that there has been action to follow up on (monitor) the quality of water sources from all locations with central installations, as action closely connected with used waters flowing into the particular sources. Laboratory analyses follow biological pollution with pathogenic germs and chemical pollution with toxic substances. A study made on surface sources (easier to pollute and providing two-thirds of the country's city population with water, with the remainder being supplied with deep sources which are much less affected) shows that 48 percent of these sources are not suitable bacteriologically. Once treated this water becomes somewhat better, but not very good, since it contains a large quantity of chlorine, whose action on the organism is not among the most favorable. Although it kills germs (not hepatitis germs, for example), chlorine basically changes the water quality. Sometimes it is possible for portions of non-disinfected water to escape. As Prof Dr Sergiu Manescu emphasized, we consider that it is not accidental that the studies made on disinfecting and epidemic hepatitis on the basis of disinfected water, thus, treated water, have shown that 70 percent of the cases come from the cities, whose water, although treated, was not good to drink at the source. Although underground waters are better,



Prof Dr Sergiu Manescu stated, approximately 30 percent still does not fulfill the proper qualities. Despite the fact that chemical pollution generally is less than bacterial, the lead present in reduced percentages in the air, water and foods accumulates in the organism. Spectacular intoxications have not been recorded until now but we should not forget that industry is sending compounds of metals (zinc, copper, arsenic, cadmium, chromium) into the water. Whereas methods for treating drinking water exist for bacteria, these methods are not usual in the process of treating chemical pollutants, Prof Dr Sergiu Manescu wants to specify. It would be lucky for them not yet to be present in large quantities in the water we drink. A true treatment of water from the sources used for supplying drinking water loaded with metallic products and chemical substances is not possible at this stage. Our hope lies in working out nonpolluting techniques. Studies have brought out that these substances generally reduce the organism's resistance and attack the immune system and that the particular phenomena are virulent, especially in children. The treatment stations for the industrial installations which could hold back these substances are working defectively, which also produces economic losses.

Another group of chemical substances, the synthesized ones, also must be kept in mind. Generally these are new substances for man, since they are not found in nature and, as a result, are extremely dangerous. Some of them degrade rapidly in water but others do not (pesticides, fungicides, detergents, fertilizers on the base of nitrites and nitrates, nitro and amino derivatives). Today we still do not know their action on the human organism, although their presence in water, even in Bucharest's water, is more and more frequent. As a result, along with severe restrictions on the use of the particular substances, thorough studies on the new impact of synthesized substances on human organism are also needed.

#### Concern for the Other Person

That same concern which man has for the quality of the water he drinks also must be shown for the water he uses, the virtual source of drinking water for his neighbors. The installations for treating the water coming into the cities, strict monitoring of them, and the obligation to respect the standards in effect also must exist at the other end. Otherwise, gradually, no matter how much effort is made to treat the water supplying the cities, they will prove inefficient. For example, I was told at the Water Management Office of Bucharest that the city has one of the best waters in Europe from the viewpoint of natural qualities and treatment methods. This water, which tastes good, which is bacterially pure and which enjoys treatment at numerous stations and multiple laboratory monitoring, is so expensive that the investments needed to provide 1 liter of water distributed in the city are valued at 500,000 lei, I was told by eng Petre Sendroiu, chief of service at the above-mentioned institute; once used, it often does not enjoy that same scrupulous care for treatment of it. Although Bucharest does not have a treatment station for used water yet (the capital allocated for this purpose will remedy this situation in coming years), most of Bucharest's enterprises have made the effort to improve their local treatment stations to correspond with the duty set by law: theoretically no enterprise can be put into operation without treatment installations being notified or without broadening existing ones.

Despite this, violations of the Law on Waters No 8/1974 have been recorded. In 1982, in this regard, 55 acts of contravention occurred in the municipality of Bucharest. An example directing our attention to the seriousness of this is the case of the Spirt-Drojdie-Fulgerul-Bragadiru Enterprise, for which steps were taken in April 1983 to close it. Since 1982 the project has expanded without the legally notified step for treatment. The effect has been serious pollution of the Ciorogirla River, which as a tributary also affects the Sabar River used for irrigation, although the irrigation with this water was prohibited. Lags also exist at the Industrial Electronics Enterprise, at Inox, at the Buftea Beekeeping Enterprise, at Metaloglobus, at the Mogosoaia Socialist Agricultural Enterprise, Ferma Rosia and so forth. The 850 projects on the territory of the municipality of Bucharest throw their water into the Dimbovita, a true collector of used water, one which is powerfully impurified.

The polluters, aware or not yet aware, must understand that a treatment station for used water is a need, a vital matter in a modern society and that such an installation is not a magic box; it needs care and improvement.

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END